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ABSTRACT

This publication includes a survey and descriptions of selected state energy education curriculum materials. The basic tasks of the survey were to determine, (1) if states had systematic energy education programs for their elementary and secondary schools, and (2) if existing curriculum materials met national needs. An instrument to evaluate energy education materials was developed and used. A telephone survey was made of state science curriculum coordinators who did not reply to a mail survey. Generalizations made from survey data include: (1) energy education materials tend to stress technical topics; (2) they often lack consistant core themes and adequate conceptual framework; and (3) they provide little that is useful in developing an alternative energy ethic. Four primary and five more specific secondary recommendations based on survey data and project involvement in energy education are given. The energy curriculum materials of twenty selected states are described and procurement information is included. (MR)

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A Survey of Precollege Energy Education Curricula at the State Level

THE ENERGY INSTITUTE

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SE 024 270

A SURVEY OF PRECOLLEGE ENERGY EDUCATION CURRICULA AT THE STATE LEVEL*

Robert M. Jones and John E. Steinbrink

INTRODUCTION

Energy education recently has become important. Just as the nation is attempting to develop a comprehensive, systematic energy policy, so is there a need to have a coordinated and effective precollege energy education policy. This survey represents one attempt at identifying baseline data which can be employed in the development of an energy education policy that will lead in turn to more effective teacher training programs and instructional materials.

The purpose of this study was to gain a better understanding of the status of precollege energy education in the United States by surveying state departments of education. Results from the study reveal that although only approximately one-third of the states already have energy education programs, many states are developing programs. Based upon the survey, recommendations for improving energy education curricula are given.

In September, 1976, the staff of the Energy Awareness Project at the University of Houston at Clear Lake City initiated a national survey of energy education at the state level. The survey employed

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*This study was funded by a series of grants from The Energy Institute at the University of Houston and was carried out by the staff of the Energy Awareness Project at the University of Houston at Clear Lake City. Mary D. Otahal, Research Associate, compiled the data and carried out the preliminary evaluation.

criteria adapted from a national evaluation of environmental education programs[1] and was completed in June, 1977. At this time, more than 90% of the states had responded or submitted materials for evaluation. The analysis of these materials has proven useful in the curriculum development efforts at the University of Houston at Clear Lake City and should be useful to others. The project staff's central purpose has been to describe perceived strengths and weaknesses of energy curricula now available and, more importantly, to present some useful guidelines for further research and development.

This study was conducted by educational practitioners for use by other educational practitioners; primarily, state and local curriculum coordinators and classroom teachers. The objective of the survey was not to carry out empirical research using a social science methodology, but rather to learn which state departments have energy education materials or programs, what the teaching/learning characteristics of these materials are, and how can the materials be obtained. Just as the study does not explore complex cause and effect relationships, it also does not analyze the extent of program implementation in the various states.

RESEARCH DESIGN

The initial phase of the research involved the development of an instrument to evaluate curriculum materials in energy education. A checklist was composed, based on some of the criteria used in Environment-Based Environmental Education: Inventory, Analysis, and Recommendations

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[1]Marcus, M. et al. Environment-Based Environmental Education: Inventory, Analysis and Recommendations. Final report for USOE, Contract No. OEC-74-8739, 1975.

and on the characteristics of curriculum judged desirable by the staff (Appendix A). The checklist was developed to assure a standard and complete evaluation of the varied materials.

The next phase of the survey was the initiation of materials acquisition from the chosen population: the fifty state departments of education. In November, 1976, a letter describing the project staff's objectives, and requesting state department-developed energy education materials, was sent to the attention of the "Science Curriculum Coordinator" of each state department. As the programs were received in reply, the evaluation process began.

In May, 1977, a follow-up phone inquiry was made to the states that had not responded. A request for state level materials was directed to the "Energy Education or Science Curriculum Coordinator." More curriculum programs were received and evaluated.

In several cases, a second letter, with an easy-return inquiry form, followed the phone call.

RESULTS OF THE SURVEY

Response Levels

Letter, November 1976: Twenty-eight states responded to this initial communication. Thirteen energy education programs were received and evaluated.

Phone Inquiry, May-June 1977: The total response level was brought up to 45 states. Five more curriculum projects were received and evaluated.

Letter and Form, May-June 1977: The total response level was brought up to 49 states. Two more programs were received and evaluated.

Final Response Breakdown

(1) Energy education programs were received from 20 states and evaluated by the staff. A short description of each program is presented in Appendix C.

(2) One state responded that they had developed curriculum materials and would send them but these materials had not been received by the completion date for this report.

(3) Two states have programs in preparation which will be ready within the next several months.

(4) Twenty-six states have not begun developing energy education materials or guidelines. In some cases, materials developed by other sources were implemented. In other cases, attention was only recently being turned to the possibility of energy education curriculum development.

(5) One state did not respond to any inquiries.

SUMMARY OF EVALUATION

In analyzing the programs and materials submitted by the various state agencies, the project staff has commented on the general organization in terms of format, teacher instructions, data base, and conceptual organization. In the same manner, comments are made on the pedagogy and content in general. A summary of the overall impressions is presented in that order. The data are presented in tabular form in Appendix B.

Organization

An interesting aspect of the format was that many of the programs were not truly curriculum materials because in the great majority of cases they lacked stated or implied curricular organization. They simply

gave outline objectives and the development of most instructional activities and their sequencing was left to the classroom teacher. Many programs did suggest sample activities to meet the stated objectives, but the overriding implication exists that the actual curriculum should be developed by *local personnel* well-versed in the local energy situation. Consequently, most of the guides are primarily outlines that leave much to be developed by the teacher/user.

Inquiry as a teaching/learning mode is prominent in several programs and the majority employ some student-centered activities. Many programs deal with higher level cognitive outcomes and some suggest simulation and role playing activities; however, few include sufficient real data or background information to make these activities meaningful. In relation to background and resource materials, there are extensive bibliographies, film lists, and technical readings, but with one exception, there are no audio-visual materials or other media actually furnished. Finally, a surprisingly large number of programs include only technical readings, and the readings that are provided are principally directed toward the teacher rather than the student.

In the area of teacher instructions, almost all of the programs leave a great deal of research and development up to the actual user. The teacher is expected to research and to provide factual details. To make this situation more difficult, there are only minimal instructions for introducing, implementing, and conducting the lessons, and little teacher support in general. Data bases dealing with the science and technology of energy production and utilization, and the social issues and government regulations involved, are insufficient. When data are

presented, they are primarily teacher-directed and there is little direction as to how to present the complex and often conflicting information to students.

It appears that most of the curriculum efforts are beginning from a conceptual viewpoint; in fact, the conceptual organization of several programs is quite well thought out. The organization maintains a strong science and technology orientation, but only a few programs deal equally well with both science and social studies concepts. In no case, however, was the curriculum guide presented as a totally unorganized set of independent or unrelated activities.

Pedagogy

In assessing the pedagogical strengths and weaknesses of the curriculum materials, an attempt was made to determine the appropriateness of the units in terms of learner developmental levels, the consideration of learning outcomes in both cognitive and affective domains, and the levels of outcomes within these domains. In most cases, grade-levels were indicated, and the majority of the materials were judged to be appropriate to the stated level or range of levels. Several programs specifically stated that learner developmental levels in the design of activities had been considered.

Most of the programs introduce the concept of *the energy ethic* or the need for developing one. In many, a definite awareness is shown that personal values are crucial in energy conservation. There are few activities, however, that provide for inquiring into the ethic that has governed the development of our energy consumptive society. In the small number of programs where valuing activities are included, decisions are

demanded without either sufficient personal involvement or an appropriate length of time to form internalizations and complex value orientations. The materials tend to call for an *instant reorientation*. Thus, while there is an awareness of the need for a rethinking and restructuring of values, little that is useful is provided for in the suggested activities.

As mentioned previously, taken as a whole, the programs offer many activities and inquiries to foster cognitive growth. Generally these involve some higher level process skills but are limited to scientific and technological content. There are opportunities for higher level investigations and utilization of critical thinking skills; however, many programs are dominated by convergent, lower-level recall and comprehension tasks. Very few individual programs deal consistently at the decision-making, problem-solving level.

Content

The content was evaluated in terms of technical or scientific concept orientation and relevance to contemporary social issues. Most of the programs tend toward the treatment of technical issues (energy sources, conversion, transmission, environmental impact and alternative energy sources) as opposed to social and government policy issues. Most of the programs make strong pleas for the reorientation of values to include personal energy conservation practices. There are varying levels of technical sophistication in the presentation of the materials ranging from oversimplification to inundation with complex presentations of multiple and range graphs and alternate scenarios for the future. As stated previously, most of the programs tend toward transmitting an oversimplified data base with no real guidelines for interpretation. Policy and social

issues are superficially treated in many cases and in only two programs were social issues given a priority over science and technology as a basis for study.

SUMMARY AND RECOMMENDATIONS

The basic task of this energy curriculum survey has been to address the following questions:

(1) Do the separate states have systematic energy education programs at the precollege level? Can some of the better programs be identified?

(2) Do the existing energy curriculum materials meet the national needs? What types of materials should be developed?

Upon completion of the survey, it was determined that approximately one-third of the states have energy education curricula at the state level and others are developing them. Many curricula are not sufficiently directive in the sense that they simply outline general objectives and leave the actual development of instructional activities and their sequencing up to the teacher. However, there are several outstanding programs that should be shared among the various states.

Several generalizations based on the survey of curriculum materials can be made:

(1) Energy education materials tend to stress technical topics.

(2) They do not adequately stress policy issues and the political and economic milieu in which controversial policy issues are resolved.

(3) They often lack consistent core themes and adequate conceptual frameworks.

(4) They provide little that is useful in the development of an alternative energy ethic.

Recommendations

Based upon information obtained from the survey and other efforts in curriculum development, the following recommendations are proposed. The primary recommendations are based upon the perceived strengths and weaknesses of the curricula surveyed. The supporting recommendations are broader in scope and developed from both the survey results and our total project involvement in energy education.

Primary Recommendation 1: Energy curriculum should develop core themes and a conceptual structure that synthesizes subject matter across a variety of traditional disciplines.

Primary Recommendation 2: In order that materials be immediately useable by the classroom teacher, more complete user instructions and data bases should be added to the conceptual guidelines that are now available.

Primary Recommendation 3: In acknowledgement of the need for reorientation of our energy ethic, projects and programs that stress value clarification approaches, such as role-play and simulation, should be encouraged.

Primary Recommendation 4: Energy curriculum should develop instructional materials and techniques that provide learners with decision-making and problem-solving activities that illustrate the complexities of both technical and policy issues.

The supportive recommendations discussed below are specific suggestions for implementing the primary recommendations. They are not listed in any order or priority.

Supporting Recommendation 1: Projects and programs that demonstrate an understanding of the interrelationships of local, national and international issues and problems, and their linkages should be encouraged.

Supporting Recommendation 2: Projects and programs should be developed to generate awareness of career opportunities in energy related areas.

Supporting Recommendation 3: Support should be allocated for the development of teacher training programs to familiarize teachers with both technical and policy issues so they can develop holistic and integrative materials.

Supporting Recommendation 4: A communication network for collecting, classifying and disseminating energy education materials should be developed and made available to all citizens.

Supporting Recommendation 5: Systematic analysis and evaluation of progress in energy education should be an integral component of the evolving national energy policy.

ABOUT THE AUTHORS

Robert M. Jones now an Assistant Professor of Education at the University of Houston at Clear Lake City, has an Ed.D. in science education from Oklahoma State University. He is involved in curriculum development and is Co-Director of the Energy Awareness Project at UH/CLC.

John E. Steinbrink, now an Associate Professor of Education and Geography at the University of Houston at Clear Lake City, has an M.A.T. from the University of Chicago and received his Ed.D. in social science education at the University of Georgia. He is interested in humanistic curriculum development and is Co-Director of the Energy Awareness Project at UH/CLC.

Mary Otahal is now a special education teacher in the La Porte Texas school system. Ms. Otahal was a Research Associate with the Energy Awareness Project and was in charge of data collection and analysis for the survey.

APPENDIX A:

EVALUATION CHECKLIST

STATE _____

PROGRAM TITLE _____

EVALUATION

	yes	no
A. Organization		
1. Format		
a. Activity Guide		
(1) games		
(2) simulation/role-play activities		
b. Readings		
(1) teacher-directed		
(2) student-directed		
c. Audio-Visual Materials		
d. Resource Lists		
2. Teacher Instructions		
3. Data Base		
4. Conceptual Organization		
B. Pedagogy		
1. Grade-Level Specified		
2. Affective Development		
3. Cognitive Development		
a. Level I Skills (observation, measurement and classification)		
b. Level II Skills (inference, hypothesis and prediction)		
c. Level III Skills (decision-making and problem-solving)		
C. Content		
1. Policy Issues (governmental, economic, sociological, and historical)		
2. Technical Issues		

APPENDIX B:

EVALUATION RESULTS

EVALUATION RESULTS

	yes	no
A. Organization		
1. Format		
a. Activity Guide	17	3
(1) games	8	12
(2) simulation/role-play activities	7	13
b. Readings		
(1) teacher-directed	12	8
(2) student-directed	7	13
c. Audio-Visual Materials	1	19
d. Resource Lists	17	3
2. Teacher Instructions	16	4
3. Data Base	14	6
4. Conceptual Organization	14	6
B. Pedagogy		
1. Grade-Level Specified	16	4
2. Affective Development	11	9
3. Cognitive Development		
a. Level I Skills (observation, measurement and classification)	20	Ø
b. Level II Skills (inference, hypothesis and prediction)	19	1
c. Level III Skills (decision-making and problem-solving)	13	7
C. Content		
1. Policy Issues (governmental, economic, sociological, and historical)	19	1
2. Technical Issues	20	Ø

APPENDIX C:

PROGRAM DESCRIPTIONS

COLORADO

Colorado's A Teacher's Handbook on Energy (April 1974) has been developed by a committee of state educators "to provide information to Colorado teachers to help students better understand current and projected energy problems." (p. vi)

This 150 page book contains student activities (largely taken from curriculum guides developed by Washington and Oregon), conservation checklists, teacher background readings and data, and a list of resources (literature, individuals, and agencies) for teacher use.

This handbook deals well with both technical and policy issues, and attempts to involve the reader in values clarification as well as in cognitive development.

Most of the information in the handbook, excepting the activities and some of the many lists, charts, and graphs, is teacher-directed, designed to aid the local district or individual teacher in the actual development of energy curriculum.

For information contact:

Dr. Cal Anderson
Department of Supporting Services
Colorado Department of Education
Denver, Colorado 80203

DELAWARE

Delaware has developed a working draft entitled Thinking About Energy which consists of three volumes: K-4 (38 pages), 5-8 (98 pages), and 9-12 (140 pages). The draft is to be field tested in 1977-78.

The primary section includes simple activities and discussion topics, puzzles, definitions, resource lists of literature, and films and multimedia kits for students and for teachers.

The intermediate section has background readings for the teacher and related activities and discussion questions. Sample energy demonstrations, an energy crisis opinion poll, a conservation checklist, puzzles, a teacher resource section of graphic data, a glossary of technical terms, and resource lists are also included.

The secondary level section contains more extensive and sophisticated background materials for teacher and student. Classroom activities and discussion questions organized by subject area (history, art, drama, biology, economics, etc.), as well as club and community activities, are suggested. A teacher resource section with narrative and graphic information, resource lists and a technical glossary complete the package.

At all grade levels policy and technical issues are thoroughly treated by way of mostly discussion activities. The student resource lists are particularly helpful.

For information contact:

Douglas R. Macbeth
Office of Science and Environmental Education
Delaware State Department of Public Instruction
Dover, Delaware 19901

FLORIDA

Florida is very active in curriculum development in the areas of environmental and energy education. The system used in this state is a "mini-grant program" whereby funds are awarded to districts and schools that propose to develop curriculum projects. This program has successfully produced a great number and variety of projects.

The state also provides general guidelines (Florida Master Plan and Action Guide for Environmental Education, April 1976.) and teacher training programs.

In addition, the state department of education has reprinted an activity guide developed by a teacher workshop at Florida State University entitled Energy and the Environment (100 pages, 1976). This guide includes goals and concepts to be taught and instructional units in social science, science, and home economics. The units are, for the most part, lists of activities including investigations, discussions, puzzles, games, decision-making, and simulation/role-playing activities. Policy and technical issues are dealt with thoroughly. Both affective and cognitive development are sought.

For information contact:

James M. Phillips
Consultant, Environmental Education
State of Florida
Department of Education
Tallahassee, Florida 32304

INDIANA

Total Environment Education (1975), developed by the Indiana Environmental Education Advisory Committee, comprised of educators and consultants, provides extensive instruction on how to organize and operate an environmental education program at the local level.

One of the six global content objectives suggested deals directly with energy utilization and research (pp. 41-46). This section lists specific instructional objectives, classified by subject areas of application, and appropriate grade-level. The educator is to follow the four outlined model units with sample activities, and develop his/her own methods to reach the objectives.

The volume includes a list of environmental education curriculum resources and their costs.

For information contact:

John A. Harrold
Director, Division of Curriculum
State of Indiana
Department of Public Instruction
120 West Market Street -- 10th Floor
Indianapolis, Indiana 46204

LOUISIANA

Conservation of Energy (Teacher's Activity Guide) was prepared by a group of Louisiana teachers from all levels in April 1975, to provide information for teachers to use in development of energy education curriculum.

This 109 page book contains background information for teachers; an extensive list of ways to conserve energy; a list of activities classified by grade-level and designed to promote attitude development, decision-making, and action; sample lesson plans; a list of literature and films; and a glossary of technical terminology.

Several role-playing activities promoting personal student involvement are outlined. The over-all emphasis is on development of the conservation ethic.

Much of this guidebook is teacher education materials and leaves the manner of usage of the activities to the individual teacher.

For information contact:

Donald W. McGehee
Assistant Supervisor of Science
Louisiana State Department of Education
Baton Rouge, Louisiana 70802

MARYLAND

Environmental Education, A Maryland Approach (1974) is a 60 page curricular framework. It includes a very brief position statement for teachers, and a listing of target concepts and desired student behaviors, grouped in three categories: science and technological, social and aesthetic considerations; and organized by grade-level (K-12).

Only two technical subconcepts deal specifically with energy. Several others deal with the conservation of natural resources in general.

For information contact:

James W. Latham, Jr.
Consultant in Science
Division of Instruction
Maryland State Department of Education
P. O. Box 8717
Balto-Wash International Airport
Baltimore, Maryland 21240

MICHIGAN

A team of Michigan educators and industry representatives has produced a 58 page booklet entitled Energy Conservation, Guidelines for Action (April 1974). It is designed to aid local school district development of energy education programs.

The booklet contains brief background reading for the teacher, goals and objectives, and representative student activities taken from nine briefly summarized energy education programs developed by various sources. An annotated listing of multimedia student resources is included as well as a teacher reading bibliography and explicit instructions on how to develop actual energy curriculum.

While this publication is not an actual piece of energy curriculum, it might be most useful in the development of such materials.

Copies of this publication are available at $0.50 plus mailing or shipping charges from:

Region Nine Superintendents
Michigan Association of
School Administrators
421 West Kalamazoo Street
Lansing, Michigan 48933

MINNESOTA

As a part of their environmental education program, an interdisciplinary team in Minnesota has developed a packet of eleven Junior-Senior High level energy activities entitled Energy/Consumerism (1973-75).

The activities are classified by three areas of main emphasis: 1) collecting information, 2) exploring values, and 3) action.

Each activity is presented as an independent unit with its own goal statements. Each can be fit into existing curriculum. The emphasis of all the activities is the personal assumption of the conservation ethic.

Background information sheets on energy policies, some technical information, and the process of values clarification are included for use with the activities. Finally, there is a bibliography, a human resource list, and a glossary of technical terminology.

For information contact:

John C. Miller
Environmental Consultant
Minnesota Department of Education
644 Capitol Square Building
St. Paul, Minnesota 55101

NEBRASKA

Nebraska has duplicated and distributed two NSTA energy mini-courses: Transportation and Heating Our Homes (1976, approximately 30 pages each).

Transportation consists of five sequential upper elementary social studies lessons. Concepts, behavioral objectives, and teacher suggestions are given. Graphic data, evaluation suggestions, and resource lists are included. Technical and policy issues are dealt with, and personal choice by the student is well provided for.

Heating Our Homes, for secondary science students, follows essentially the same format. These lessons deal essentially with the technical and the cognitive. Readings for student and teacher are provided.

In both these mini-courses, the teacher instructions are exemplary, and the data base is sufficient for the suggested activities dealing with the specific topics of transportation and space heating.

For information contact:

M. Anne Cambell
Nebraska Department of Education
Sixth Floor, State Office Building
P. O. Box 94987
Lincoln, Nebraska 68509

NEW JERSEY

Energy Crisis, A Teacher's Resource Guide (February 1974) is a 12 page supplement to the New Jersey Environmental Education program.

The pamphlet states eleven student objectives, with brief background reading, graphic data, and suggested activities for each objective.

The emphasis of the objectives is on increasing student understanding of technical and policy issues.

There are also examples of student evaluation devices and a multimedia reference list.

For information contact:

New Jersey Education Association
180 W. State Street
Trenton, New Jersey 08608

NEW MEXICO

In 1977, New Mexico developed a Teacher Supplement to Energy Conservation to accompany the booklet Understanding and Activities for Young People, published by FEA in 1976. This 175 page book contains twelve instructional units, referenced to the FEA booklet. Each unit consists of behavioral objectives, basic information for teacher and student, including many graphs and charts, suggested test questions and answers, and suggested activities. A brief resource list is included.

The goal of the program is to increase the student's understanding of both policy and technical energy issues. The factual information on these issues is extensive and well-organized.

For information contact:

B. K. Graham
Science Specialist
State Department of Education
Santa Fe, New Mexico 87503

NEW YORK

Living Within Our Means: Energy and Scarcity is a two volume (K-6 and 7-12) activity manual.

Each volume begins with a list of environmental "understandings" or concepts to be taught. The activities are referenced according to these understandings and classified according to the appropriate subject area (Language Arts, Mathematics, Science, Social Studies, and Home Economics) and grade level where they can be fit into the existing curriculum.

Each activity uses energy education content to teach skills from one of the five subject areas listed above. The energy facts used are generally technical, and the "other-subject" skills are cognitive.

The activities in many cases consist of suggested readings or topics and a list of discussion questions, a format more appropriate at the upper-grade levels.

Each volume also contains a multimedia reference list.

For information contact:

The University of the State of New York
The State Education Department
Albany, New York 12224
ATTN: Publications Distribution

NORTH CAROLINA

In February 1974, North Carolina published Environmental Education: Strategies for Wise Use of Energy, a 71 page booklet of instructional activities for students at all levels. Activities include discussions, investigations, energy math, some role-play and games, and deal with both policy and technical issues. An outline of how to make value judgments is included. A conservation checklist, charts, a technical glossary, and resource lists of readings and films complete the package.

In October 1975, Energy Conservation, A Sourcebook (10 pages) was published. This booklet states basic energy principles, and provides learning experiences organized by size of student group. Here again, policy and technical issues are dealt with, and a checklist and resource list are included.

For information contact:

Clinton L. Brown
Science Consultant
North Carolina Department of
Public Instruction
284 Education Building
Raleigh, North Carolina 27611

OHIO

Ohio's A Teacher's Introduction to Energy Conservation (1975) is an 89 page booklet that contains an E.Q. (Energy Quotient) Quiz and extensive, mostly technical background readings for teachers. It also includes a glossary of technical terminology. Teaching units with objectives and activities are suggested for the Junior High and Middle School level and the Senior High level. A bibliography, with specific topical listings, is included. Several illustrative slides complete the package.

The emphasis of this teacher education program is on the increased understanding of the technical aspects of the energy situation.

For information contact:

Dr. John Hug
Consultant, Environmental Education
Ohio Department of Education
65 S. Front Street
Room 801
Columbus, Ohio 43215

PENNSYLVANIA

An interdisciplinary writing staff developed Pennsylvania's The Environmental Impact of Electrical Power Generation: Nuclear and Fossil (1975) under ERDA contract. This 236 page book is a collection of readings about the technical aspects of electrical power generation. Also included are a glossary, an extensive bibliography, and a decision-making model to help the reader analyze the information presented.

While the book is presented as curriculum material to be used by students, the extreme technicality of the readings would place them above the level of most secondary students. Considerable background in the physical sciences and excellent reading and chart/graph interpretation skills would be needed to utilize this book.

This mini-course is available, for $3.05 from:

The Superintendent of Documents
U. S. Government Printing Office
Washington, D. C. 20402

SOUTH CAROLINA

The Energy Book (1973) is a 29 page activity guide. The activities are organized by grade level, number of students involved, and subject areas. The guide is for use at all levels.

Both technical and policy issues are touched upon; the expressed goals include knowledge, skills, and values. Several role-playing activities are suggested.

Conservation checklists, and resource lists of films and literature are also included.

For information contact:

Ms. Alice Linder, Consultant
Environmental Education
South Carolina Department of Education
Columbia, South Carolina 29200

Cost to out-of-state requestors is $1.50.

TEXAS

Texas has developed Suggested Activities for Environmental Education in the Secondary Schools (39 pages) and a companion publication at the elementary level. The secondary booklet begins with an introductory statement emphasizing student attitude change and action. A model defines three variables to be considered in development of curriculum: personal concerns, the individual learning process, and environmental concerns.

One of the environmental concerns treated is energy conservation. (p. 25) A very brief overview, generalizations and suggested activities are provided. Most of the guidelines deal with technical aspects of the energy situation.

There is also a brief list of agencies where environmental information may be obtained.

For information contact:

Texas Education Agency
201 East 11th Street
Austin, Texas 78701

The Texas Education Agency also promotes the use of the Encore materials developed at Texas A & M University. They consist of nineteen instructional modules written by teachers in a summer workshop. The modules were developed for upper elementary, junior high, and high school students.

The Encore modules treat technical topics primarily. The units are well done and have up-to-date technical and popular bibliographies.

For information contact:

Dr. Daniel L. Householder
Project ENCORE
Department of Industrial Education
Texas A & M University
College Station, Texas 77843

VIRGINIA

Environmental Education Guide K-12 (July 1974) is a 94 page publication designed to aid in local development of environmental investigations.

The guide presents over-all program goals and seventeen sample investigations, with specific objectives and suggested procedures. One of these investigations, at the secondary level, deals with energy. (pp. 51-56) Its goal is the critical examination of the energy situation, with emphasis on policy issues.

This guide shows a particular sensitivity to grade-level appropriateness of activities and the skills involved.

For information contact:

C. R. Davis
State Department of Education
P. O. Box 6-Q
Richmond, Virginia 23216

WEST VIRGINIA

West Virginia has published a 14 page pamphlet entitled Do We Understand Energy? (1975). It contains a policy statement, a very brief technical background reading, a conservation checklist, and teacher guides to energy related activities. Concepts and activities are outlined at the primary, intermediate, junior high, and secondary levels. Almost all are concerned with investigating technical aspects of energy education.

For information contact:

Mr. Bob Seymour
State of West Virginia
Department of Education
Charleston, West Virginia 25305

WASHINGTON

Energy and Man's Environment, Elementary Through Secondary Interdisciplinary Activity Guide (Second Revised Discussion Draft, 1973, 111 pages) has been developed in cooperation with the Oregon and Idaho State Departments of Education to provide energy materials to teachers to help them and their students to better understand the important role of energy in our daily lives.

Very brief background reading is provided for the teacher and over-all objectives are stated. The activity guide is well-organized in chapters by topic. Each chapter contains objectives classified by theme (scientific, ethical, aesthetic, and utilitarian) and by grade-level. Many and varied activities corresponding to the objectives are provided. Some games and role-playing activities are suggested.

Following the chapters are a glossary of technical terms, a teacher-directed bibliography, and a few reproducible charts and graphs.

This guide deals thoroughly with both policy and technical issues, and attempts to involve the student in the development of his/her personal energy ethic.

For information contact:

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Energy and Man's Environment
0224 S. W. Hamilton
Skyline Building, Suite 301
Portland, Oregon 97201

For additional copies of this monograph, please contact:

The Energy Institute
University of Houston
Houston, Texas 77004

or phone (713) 749-3272

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- Summary and Conclusions: Sociological Dimensions of the Energy Crisis--A Follow-Up Study. Dr. David Gottlieb and Dr. Marc D. Matre.
- An Investigation into New and Emerging Occupations for Energy Research and Development. Dr. Donald L. Davis.
- Energy Conservation in Houston: Household and Transportation Practices. Dr. Seymour Warkov.